

removing the holder from the electronic image sensor following the capture of at least one dental image.

19. (New) The method as set forth in Claim 18, wherein the electronic image sensor comprises a CMOS active pixel sensor array.

20. (New) The method as set forth in Claim 18, wherein the electronic image sensor comprises a charge-coupled device.

21. (New) The method as set forth in Claim 18, wherein the adhesive is selected from the group consisting of tape, epoxy, hot melt, and sealant.

## REMARKS

Claims 1-11, 14, 15 and 17-21 are pending in this application, with claims 1, 7, 11 and 18 being independent. Claims 1-11, 14, 15, 17 and 18 have been amended. Claims 19-21 have been added. Claims 12, 13 and 16 have been cancelled. Favorable reconsideration is respectfully requested.

The Office Action objected to claims 5, 6, 9, 10, 16 and 17, as reciting a Markush type group using the term “comprising.” In response, Applicants have amended those claims (except claim 16, which has been canceled) to replace “comprising” with the term “consisting of.”

Turning to the art, the Office Action rejected claims 1, 4 and 5 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,001,738 to Brooks; claims 7, 8, 9, 11, 12, 16 and 18 under 35 U.S.C. § 103(a) as obvious from Brooks; claims 2, 3 and 13-15 under Section 103(a) as obvious from Brooks in view of U.S. Patent No. 6,320,934 to

Carroll; and claims 6, 10 and 17 under Section 103 as obvious from Brooks. These rejections are respectfully traversed.

As recited in independent claim 1, the present invention is directed to a positioning system for dental x-ray examinations comprising an electronic image sensor, a sheath covering the image sensor and a holder. The holder is removably bonded to the sheath by an adhesive. Independent claim 11 is also directed to a position system for dental x-ray examinations. Claim 11 parallels claim 1, but does not recite the sheath, and recites a removable bond between the holder and the sensor. Independent claim 7 is directed to a method for positioning an electronic image sensor. The method includes the steps of placing the electronic sensor in a sheath, affixing a holder having an adhesive coating to the sheath to create a removable bond, positioning the holder and sheath in a patient's mouth, capturing at least one dental image and removing the holder from the sheath after the at least one image is captured. Independent claim 18 is also directed to a method for positioning an electronic image sensor. Claim 18 generally parallels claim 7, but does not recite placing the electronic sensor in a sheath, and recites a removable bond between the holder and the electronic sensor.

Each of independent claims 1, 7, 11 and 18 recite the salient feature of a positioning system or method that uses an adhesive to create a removable bond between a holder and sheath covering an electronic sensor, or an electronic sensor itself. This feature is neither taught nor suggested by the prior art.

In dental x-ray imaging, the accurate positioning of the image receptor (be it an electronic image sensor or a piece of film) is critical. The positioning system or method used, therefore, has a correspondingly important impact on the image quality obtained. This is particularly true in the case where an electronic image sensor is used, since such sensors tend to be larger, thicker and heavier than film, and often have cables extruding from them, and therefore present unique positioning problems.

Conventional systems and methods for positioning electronic sensors typically use an approach in which the sensor is mechanically gripped around its edges. While acceptable for some applications, such gripping devices have several drawbacks. Most notably, such devices present distinct protrusions around the edges of the sensor, which protrusions are quite uncomfortable for, and in many cases can even cause injury to, the patient being examined. Moreover, because such positioning systems present a fixed relationship between the sensor and the bite area, they afford very little flexibility in terms of how the sensor may be placed relative to the dental anatomy being imaged.

The present invention overcomes these drawbacks by providing a positioning system which uses an adhesive that allows a removable bond to be created between the holder and the electronic sensor (or the sheath covering the sensor, as the case may be). This technique provides a positioning system that is free of the protrusions that plagued conventional systems, and affords the practitioner a great amount of flexibility in where the bite area may be positioned relative to the sensor's active area. The result is a positioning system that maximizes patient comfort and the quality of the images obtained.

Brooks does not relate to a positioning system or method at all, and does not teach or suggest an electronic sensor. Instead, Brooks describes a conventional technique for assembling a film packet having an integrated bite tab. The purported invention of Brooks is what it calls "aligning means" on the bite tab, which aligning means are simply lines drawn on the bite tab. Those aligning means have nothing to do with the present invention.

The manufacturing technique, and specifically the portion in which the bite tab and film packet are integrated, is described in Brooks as follows:

FIG. 2 shows the bottom of the bite tab 12 before being attached to the film packet 11 while FIG. 3 shows a top

plan view of the bite tab 12 of FIG. 2. FIG. 2 has the back surface 21 coated with an adhesive and has a pair of openings 22 and 23. As seen in FIG. 3, bit tab 12 is folded on the fold line 24 which brings the openings 22 and 23 into direct alignment so that the adhesive can attach the portions 25 and 26 together to form the extending part of the bite tab while end 27 is folded on the fold line 28 and end portion 30 is folded on the fold line 31 so that the end portions 27 and 30 cover most of the film packet portion 11 and allow the adhesive surface thereon to attach directly on top of an existing film packet which already has the x-ray film mounted between paper or plastic materials to seal the film from light radiation.

(col. 3: 37-52).

As conceded by the Examiner, Brooks does not teach that the holder is removably bonded to the image receptor and does not teach that the image receptor is an electronic sensor. The applicants respectfully submit that it would not have been at all obvious from the manufacturing technique described in Brooks to create the novel positioning system of the present invention.

To begin with, the problems and goals of positioning an electronic sensor are fundamentally different from the problems and goals of positioning a piece of film. In the film-based system of Brooks, after an image is taken the entire arrangement is disassembled, the piece of exposed film is extracted for developing, and the integrated bite tab film packet is discarded. Therefore, there is absolutely no motivation to create a removable bond between the bite tab and the film packet, since neither the bite tab nor the film packet is ever re-used.

In the case of an electronic sensor, in stark contrast, both the holder and certainly the sensor (which typically retails for several thousands of dollars) are reused repeatedly. By way of example, with the present invention a dental practitioner who has used the electronic sensor to image a first patient's dental anatomy may remove the holder from the sensor, sterilize the sensor and removably bond another holder to the

sensor so as to be able to image a second patient's dental anatomy. Or, with the present invention a dental practitioner who has taken a first image of a patient's anatomy may remove the holder from one part of the sensor and then removably bond the same holder to another part of the sensor, in order to more effectively image a different area of the same patient's anatomy. Since re-using a piece of film that has been exposed is not possible under any circumstances, the utilization of a removable bond would serve no purpose, and it would therefore not have been at all obvious to one of ordinary skill to use a removable bond in the film-based system of Brooks.

Moreover, applicants respectfully submit that the use of an adhesive that creates a removable bond would be unsuitable for Brooks, since if such an adhesive were used in the Brooks manufacturing technique, significant problems would occur. More particularly, in the manufacturing technique of Brooks, the same adhesive that attaches the bottom of the bite tab 12 to the film packet 11 is used to attach the upstanding walls (created by folding the bite tab along line 24) to one another. It is desirous that the bond between those upstanding walls be permanent, since if it were removable, the mechanical action of the patients' teeth would cause the walls to shift, which would in turn comprise the integrity of the x-ray images being obtained. Accordingly, one of ordinary skill would never consider using an adhesive that creates a removable bond in the manufacturing process of Brooks.

Carroll is merely directed to a sensor characterization storage device in an x-ray image sensor, and does not discuss the use of adhesive at all, let alone discuss a positioning technique that uses an adhesive to create a removable bond. Carroll, therefore, does not correct the deficiencies of Brooks, and cannot render obvious the pending claims.

Accordingly, the applicants respectfully submit that the independent claims are plainly patentable over Brooks or Carroll, or any combination of the two, and respectfully request the Examiner to remove the rejections.

The remaining claims are all dependent from one of the independent claims discussed above, and each partakes in the novelty and non-obviousness of its respective base claim. The dependent claims also recite additional patentable features of the present invention, and individual reconsideration of each is respectfully requested.

CONCLUSION

In view of the foregoing remarks, the applicant requests favorable reconsideration and early passage to issue of the present application.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 06-1205.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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MARKED-UP VERSION SHOWING CHANGES MADE TO THE CLAIMS

1. (Amended) A positioning system for dental x-ray examinations, comprising:
  - an electronic image sensor;
  - a sheath covering the electronic image sensor; and
  - a holder [having an adhesive coating and] removably bonded to the sheath by [the] an adhesive [coating].
2. (Amended) The positioning system as set forth in Claim 1, wherein the electronic image sensor comprises a charge-coupled device.
3. (Amended) The positioning system as set forth in Claim 1, wherein the electronic image sensor comprises a CMOS active pixel sensor array.
4. (Amended) The positioning system as set forth in Claim 1, wherein the holder is bonded to the sheath at any point along a surface of the electronic image sensor.
5. (Amended) The positioning system as set forth in Claim 1, wherein the sheath is a material selected from the group [comprising] consisting of paper, cotton, sponge, rubber, plastic, latex, and nylon.

6. (Amended) The positioning system as set forth in Claim 1, wherein the adhesive is selected from the group [comprising] consisting of tape, epoxy, hot melt, and sealant.

7. (Amended) A [system] method for positioning an electronic dental [x-ray examinations] image sensor comprising the steps of:

[an image sensor;]

[a sheath covering the image sensor;]

[an adhesive coating on the sheath; and]

[a holder bonded to the sheath by the adhesive coating.]

placing the electronic sensor in a sheath;

affixing a holder having an adhesive coating to the sheath to create

a removable bond between the holder and the sheath;

positioning the holder and the electronic sensor within the mouth

of patient;

capturing at least one dental image; and

removing the holder from the sheath following the capture of the at  
least one dental image.

8. (Amended) The [system] method as set forth in Claim 7, wherein the holder is bonded to the sheath at any point along a surface of the electronic image sensor.

9. (Amended) The [system] method as set forth in Claim 7, wherein the sheath is a material selected from the group [comprising] consisting of paper, cotton, sponge, rubber, plastic, latex, and nylon.

10. (Amended) The [system] method as set forth in Claim 7, wherein the adhesive is selected from the group [comprising] consisting of tape, epoxy, hot melt, and sealant.

11. (Amended) A positioning system for dental x-ray examinations, comprising:

an electronic image [receptor] sensor; and  
a holder removably bonded to the electronic image [receptor] sensor by an adhesive [coating].

12. (Cancelled).

13. (Cancelled).

14. (Amended) The dental positioning system as set forth in Claim [13] 11, wherein the electronic image sensor comprises a CMOS active pixel sensor array.

15. (Amended) The dental positioning system as set forth in Claim [13] 11, wherein the electronic image sensor comprises a charge-coupled device.

16. (Cancelled).

17. (Amended) The dental positioning system as set forth in Claim 11, wherein the adhesive is selected from the group [comprising] consisting of tape, epoxy, hot melt, and sealant.

18. (Amended) A [holder for a dental image receptor having an adhesive coating to removably bond said holder to the dental image sensor] method for positioning an electronic dental image sensor, comprising steps of:

affixing a holder having an adhesive coating to the electronic image sensor to create a removable bond between the holder and the electronic image sensor;

positioning the holder and the electronic image sensor within the mouth of a patient;

capturing at least one dental image; and

removing the holder from the electronic image sensor following the capture of at lease one dental image.